

CLAIMS

What is claimed is:

1. A feed system for a strapping machine of the type having a strap supply and a strap chute, the strapping machine including a strapping head disposed between the strap supply and the chute, the strapping machine configured to position, tension and seal a strap material around a load, the feed system comprising:

a strap path from the strap supply to the strapping head;

a pair of tensioning wheels disposed along the strap path proximal the strap supply;

a pair of feed wheels disposed along the strap path proximal the strapping head, the feed wheels defining a nip therebetween;

a feed wheel drive operably connected to one of the feed wheels and a tensioning wheel drive operably connected to one of the tensioning wheels; and

a sensor disposed along the strap path for generating a signal to indicate a movement or a lack of movement of the strap material along the strap path,

wherein in a strapping cycle, the strap material is conveyed around the strap chute by forward rotation of the feed wheels, is retracted around the load by reverse rotation of the feed wheels and is tensioned around the load by forward rotation of the tensioning wheels, forward rotation of the tensioning wheels commencing upon receipt of the lack of movement of strap material signal following retracting the strap material, and

wherein when, following reverse rotation of the feed wheels for retracting the strap material, in a faulted strap condition, the sensor fails to generate a lack of movement signal, the feed wheels stop rotation, and the tensioning wheels rotate in a reverse direction to convey the strap material into the nip between the feed wheels.

2. The feed system in accordance with claim 1 wherein the feed wheel having the drive operably connected thereto is a driven feed wheel and the other feed wheel is an idler feed wheel and wherein the tensioning wheel having the drive operably connected thereto is a driven tensioning wheel and the other tensioning wheel is a pinch tensioning wheel.

3. The feed system in accordance with claim 1 wherein the sensor is disposed proximal the idler feed wheel to sense the movement and lack of movement

of the idler feed wheel, the movement and lack of movement of the idler feed wheel corresponding to the movement and lack of movement of the strap material signals, respectively.

4. The feed system in accordance with claim 3 wherein the tensioning wheels are movable into and out of engagement with one another, the tensioning wheels being movable out of engagement with one another when the strap material is conveyed around the strap chute and when strap material is retracted around the load, the tensioning wheels being moved into engagement with one another when the strap material is tensioned around the load and when the strap is refed into the feed wheel nip following the faulted strap condition.

5. The feed system in accordance with claim 1 wherein one of the tensioning wheels is a driven tensioning wheel and the other tensioning wheel is a pinch tensioning wheel, and including means for moving the tensioning wheels into and out of engagement with one another.

6. The feed system in accordance with claim 5 wherein the means for moving is a linkage operably connected to the pinch tensioning wheel for moving an axis of rotation of the pinch tensioning wheel toward and away from the driven tensioning wheel.

7. The feed system in accordance with claim 6 wherein the pinch tensioning wheel is mounted to an eccentric shaft operably connected to the linkage.

8. The feed system in accordance with claim 1 wherein the feed wheel drive and the tensioning wheel drive are reversible motors.

9. A feed assembly for a strapping machine of the type having a chute, and a strapping head disposed between the feed assembly and the chute, the strapping machine configured to position, tension and seal a strap material around a load, the feed assembly comprising:

a pair of tensioning wheels and a pair of feed wheels disposed along a strap path, the feed wheels rotating in a forward direction to feed the strap material into and

around the chute and rotating in a reverse direction to retract the strap material and position the strap material around the load, the tensioning wheels rotating in a forward direction to tension the strap material around the load; and

a sensor,

wherein when, following reverse rotation of the feed wheels to retract the strap material, in a faulted strap condition, the sensor fails to generate a lack of movement signal, the feed wheels stop reverse rotation, and the tensioning wheels rotate in a reverse direction to convey the strap material to the feed wheels.

10. The feed assembly in accordance with claim 9 wherein the sensor is disposed along the strap path for generating a signal to indicate a movement or a lack of movement of the strap material along the strap path.

11. The feed assembly in accordance with claim 9 including means for moving the tensioning wheels toward and away from one another

12. The feed assembly in accordance with claim 11 wherein the tensioning wheels are movable away one another when the strap material is conveyed around the strap chute and when the strap material is retracted around the load, the tensioning wheels being movable toward one another and rotating in a forward direction when the strap material is tensioned around the load and movable toward one another and rotating in a reverse direction when the strap is refeed to the feed wheels following the faulted strap condition.

13. The feed assembly in accordance with claim wherein one of the feed wheels is driven and one of the tensioning wheels is driven, the feed and tensioning wheels being driven by reversible motors.

14. A strapping machine of the type configured to position, tension and seal a strap material around a load, comprising:

a feed system;

a chute; and

a strapping head disposed between the feed assembly and the chute;

the feed system including tensioning wheels and feed wheels disposed along a strap path, the feed wheels rotating in a forward direction to feed the strap material into and around the chute and rotating in a reverse direction to retract the strap material and position the strap material around the load, the tensioning wheels rotating in a forward direction to tension the strap material around the load; and a sensor,

wherein when, following reverse rotation of the feed wheels to retract the strap material, in a faulted strap condition, the sensor fails to generate a lack of movement signal, the feed wheels stop reverse rotation, and the tensioning wheels rotate in a reverse direction to convey the strap material to the feed wheels.

15. The strapping machine in accordance with claim 14 wherein the sensor is disposed along the strap path for generating a signal to indicate a movement or a lack of movement of the strap material along the strap path.

16. The strapping machine in accordance with claim 14 including means for moving the tensioning wheels toward and away from one another

17. The strapping machine in accordance with claim 16 wherein the tensioning wheels are movable away one another when the strap material is conveyed around the strap chute and when the strap material is retracted around the load, the tensioning wheels being movable toward one another and rotating in a forward direction when the strap material is tensioned around the load and movable toward one another and rotating in a reverse direction when the strap is refeed to the feed wheels following the faulted strap condition.

18. The strapping machine in accordance with claim 14 including a pair of feed wheels and a pair of tensioning wheels, wherein one of the feed wheels is driven and one of the tensioning wheels is driven, the driven feed and tensioning wheels being driven by reversible motors.